

Improved biosensors are provided having excellent selectivity and stability properties, together with methods of preparing the biosensors. A preferred biosensor includes an electrode (12) having enzyme (16) deposited thereon together with a layer of electropolymerized polymer (18) intermingled with the enzyme (16); a crosslinked silane film (20) is applied over the polymer layer (18), and a final coating (22) of polyurethane is formed over the film (20). In preparative procedures, the enzyme (16) is electrodeposited using an aqueous enzyme solution containing a nonionic surfactant at a concentration level preferably in excess of the critical micelle concentration of the surfactant. In the case of a glucose sensor, the polymer layer (18) is preferably polyphenol, while the silane film is crosslinked (3-aminopropyl) trimethoxysilane. The preferred biosensors have greatly enhanced selectivity stabilities.